Abstract of the Disclosure

A dual fuel feed system integrated into a combustion engine carburetor has a primary fuel feed passage for flowing fuel into a venturi region of a fuel-and-air mixing passage, and a supplemental fuel channel which flows fuel into an upstream region of the fuel-and-air mixing passage. A manufacturer's independent sizing or calibration of the fuel passage and fuel channel with respect to the flow and pressure dynamics of each respective region disassociates low from high power engine calibration of fuel supplied to the engine by the carburetor body. This disassociation enables calibration to achieve a leaner fuel-and-air mixture flow during low power conditions which reduces carbon monoxide emissions and enables calibration to achieve a relatively richer fuel-and-air mixture flow during high engine power operating conditions which reduces NOx emissions. During idle and low engine power operating conditions, substantially all of the fuel which mixes with clean air flowing through the venturi of the fuel-and-air mixing passage flows from the calibrated primary fuel feed passage. During high engine power operating conditions, supplemental or additional fuel enters the fuel-and-air mixing passage via a nozzle which in-part defines the fuel channel and projects into the upstream region of the mixing passage. This additional fuel flow is induced by a vacuum created by an appreciable high volumetric flow rate of clean air about the nozzle. The fuel channel and the fuel passage preferably communicate independently with a fuel chamber of the carburetor at near atmospheric pressure. Disposed operatively in the fuel channel is a biased closed check valve which prevents supplemental fuel flow during low power conditions and delays supplemental fuel flow through the nozzle until a pre-determined vacuum level is reached. Preferably, an air bleed aperture communicates with the fuel channel between the nozzle and the check valve to delay

supplemental fuel feed through the nozzle until higher engine power operating conditions are reached, and to entrain air in the supplemental fuel flow thus improving supplemental fuel mixing with the incoming clean air flowing within the fuel-and-air mixing passage which improves engine combustion efficiency.